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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,781	10/17/2003	Jong-Ki Lee	51088/DBP/Y35	9551

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EXAMINER
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WEINER, LAURA S

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 08/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/688,781	LEE ET AL.	
	Examiner	Art Unit	
	Laura S. Weiner	1745	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17, 20-22 and 24 is/are rejected.
- 7) ☒ Claim(s) 18, 19 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10-17-03</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 7-13, 16 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kugai et al. (6,699,619).

Kugai et al teaches in column 2, Example 1, a sheet of copper foil was laminated with a sheet of metallic-lithium foil [**lithium metal**]. A first inorganic solid electrolyte layer was formed on the metallic lithium by the sputtering method using an Li<sub>2</sub>S-SiS<sub>2</sub>-Li<sub>3</sub>PO<sub>4</sub> target in an argon-gas atmosphere [**a pre-treatment layer**]. A second inorganic solid electrolytic layer was formed as a protective layer on the first inorganic solid electrolytic layer [**a protection layer**] by the sputtering method using an

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Li<sub>3</sub>PO<sub>4</sub> target in an argon-gas atmosphere. Kugai et al. teaches in column 3, Table 2, that when the thickness of the first layer is 0.1  $\mu\text{m}$  [1000 Å], the thickness of the second layer would be 0.15  $\mu\text{m}$  [1500 Å] or 0.3  $\mu\text{m}$  [3000 Å].

Since Kugai et al. teaches a pretreatment layer having a thickness of 50-5000 Å and including the claimed lithium ion conductive material, Li<sub>3</sub>PO<sub>4</sub>, then inherently the same lithium ion conductive material with an ionic conductivity of at least  $1 \times 10^{-10}$  S/cm or  $1 \times 10^{-10}$  S/cm to  $1 \times 10^{-6}$  S/cm must also be obtained.

In addition, the presently claimed property of lithium ion conductive material with an ionic conductivity of at least  $1 \times 10^{-10}$  S/cm or  $1 \times 10^{-10}$  S/cm to  $1 \times 10^{-6}$  S/cm would have obviously have been present once the Kugai et al. product is provided. *In re Best*, 195 USPQ 433 (CCPA 1977).

3. Claims 1-4, 7-13, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kugai et al. (6,699,619) in view of Takada et al. (6,200,707) or Takada et al. (6,368,746) or Kugai et al. (6,713,216).

Kugai et al teaches in column 2, Example 1, a sheet of copper foil was laminated with a sheet of metallic-lithium foil [lithium metal]. A first inorganic solid electrolyte layer was formed on the metallic lithium by the sputtering method using an Li<sub>2</sub>S-SiS<sub>2</sub>-Li<sub>3</sub>PO<sub>4</sub> target in an argon-gas atmosphere [a pre-treatment layer]. A second inorganic solid electrolytic layer was formed as a protective layer on the first inorganic solid electrolytic layer [a protection layer] by the sputtering method using an Li<sub>3</sub>PO<sub>4</sub> target in an argon-gas atmosphere. Kugai et al. teaches in column 3, Table 2,

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that when the thickness of the first layer is 0.1  $\mu\text{m}$  [1000 Å], the thickness of the second layer would be 0.15  $\mu\text{m}$  [1500 Å] or 0.3  $\mu\text{m}$  [3000 Å].

Kugai et al. teaches the claimed invention as explained above except does not specifically teach that the lithium ion conductive material has an ionic conductivity of at least  $1 \times 10^{-10}$  S/cm.

Takada et al. ('707) or ('746) teaches in column 1, lines 50-60, that  $\text{Li}_3\text{PO}_4$  is known to exhibit high ionic conductivity of the order of  $10^{-4}$  to  $10^{-3}$  S/cm or higher.

Kugai et al. ('216) teaches in column 8, Example 5, that  $\text{Li}_2\text{S-SiS}_2\text{-Li}_3\text{PO}_4$  has an ionic conductance of  $4.5 \times 10^{-4}$  S/cm.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a lithium ion conductive material with an ionic conductivity of at least  $1 \times 10^{-10}$  S/cm because Kugai et al. ('216) and Takada et al. teaches that it is known.

### ***Double Patenting***

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory

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double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1, 4-6, 8-9, 12, 14-15, 17, 20-22, 24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5, 7-9, 11-12, 14-18, 20 of copending Application No.10/842,428. Although the conflicting claims are not identical, they are not patentably distinct from each other because US application 10/842,428 claims a negative electrode for a lithium secondary battery which can be a lithium-sulfur battery comprising a negative active layer, lithium, a lithium ion conductive layer formed on the negative active material where the lithium ion conductive layer has a thickness between 20-300 Å and an ion conductivity that is at least  $1 \times 10^{-12}$  S/cm and further comprising a protective layer formed on the lithium ion conductive layer. The protective layer can be lithium phosphorus oxynitride.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

#### ***Allowable Subject Matter***


6. Claims 18-19, 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura S. Weiner whose telephone number is 571-272-1294. The examiner can normally be reached on M-F (6:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Laura S Weiner  
Primary Examiner  
Art Unit 1745

August 7, 2006